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Grumman, Rolls-Royce Sign $40 Million Pact

Data Systems Division to design British firm's new computerized test system for aircraft engines

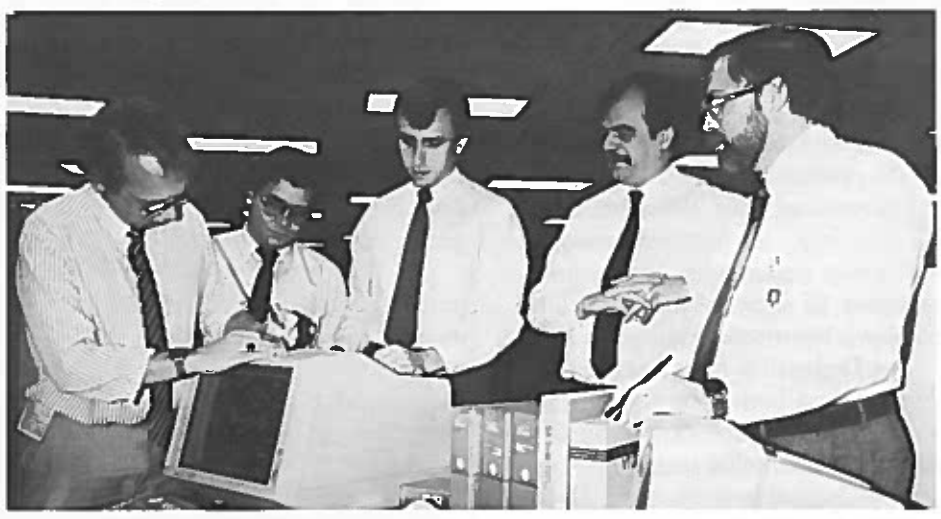
After about six months of negotiations, Rolls-Royce of England has given Grumman Data Systems the green light to design a computerized test system for jet engines.

The system is known as the third-generation Automated Data Reduction System (ADR-3). This is the first part of a three-phase, seven-year contract. Grumman has a British teammate on the project: System Designers Ltd.

Rolls-Royce is one of the world's leading manufacturers of jet engines. The ADR-3 system will link all of the company's engine test groups — about 30 in all at two Rolls-Royce sites. Through ADR-3, Rolls-Royce hopes to cut from five years to two the time it takes to develop and prove out a new engine.

The contract will total about $40 million in business over its seven-year lifespan. More important, it could open new doors for the Data Systems Division.

"Data Systems' outside sales are approaching 40 percent of its total business," says Data Systems President Bob Myers. "This contract makes Data Systems highly visible, especially in Europe."



International Team. *Among the people who are working on the Rolls-Royce contract are (L-R) Peter Holiday of System Designers Ltd.; Grummanites Rich Solla and Paul Vesely; John Pearce, also of System Designers; and Grummanite Walt Lysinger. Another group is now working on the project in England.*

Myers points out that Grumman has been designing test systems like ADR-3 for many years. "It's similar to the work we've done in-house at the Automated Telemetry Station in Calverton and with the Air Force at its Arnold Engineering Development Center in Tullahoma, Tennessee," says Myers.

Notes Program Director Charlie Schiano, "This will be the first time in Grumman's history that we will have completed an entire project overseas."

Phase one of the contract entails system design and hardware selection. There are also a lot of administrative details: while the phase one work will be split between England and the U.S., the remainder will all be done in England at a facility Grumman will lease there. Eventually, Grumman will hire about 25 British people for the project.

In addition to Schiano and Larry Krantz, the project's business manager, there are a half dozen Grumman engineers and computer specialists on the team and four people from System Designers Ltd.

The team's work will culminate in mid- to late March at a system design review, at which hardware and vendors will be selected and a system design decided upon. Once bids are received from potential equipment suppliers, the team will make up a preliminary design. Phase two of the contract, the proof-of-concept stage, begins next July.

Derby, a city in the industrial Midlands section of England, is where Rolls-Royce designs and builds commercial jet engines. Bristol, in the west near Wales, is home of its military engine group. Through ADR-3, test groups at the two sites will be able to share data - even though the two cities are 100 miles apart.

In addition to communications within and between the two locations, international data transfer capability is a must. Rolls-Royce now has cooperative development projects in progress with many other international aircraft engine suppliers.

In testing, an engine is placed in a special chamber that simulates the environmental conditions it would experience in flight. Instrumentation is attached to an engine, and an enormous number of measurements are taken. ADR-3 will gather data in real time — the data is available almost instantly, which speeds up the test process.

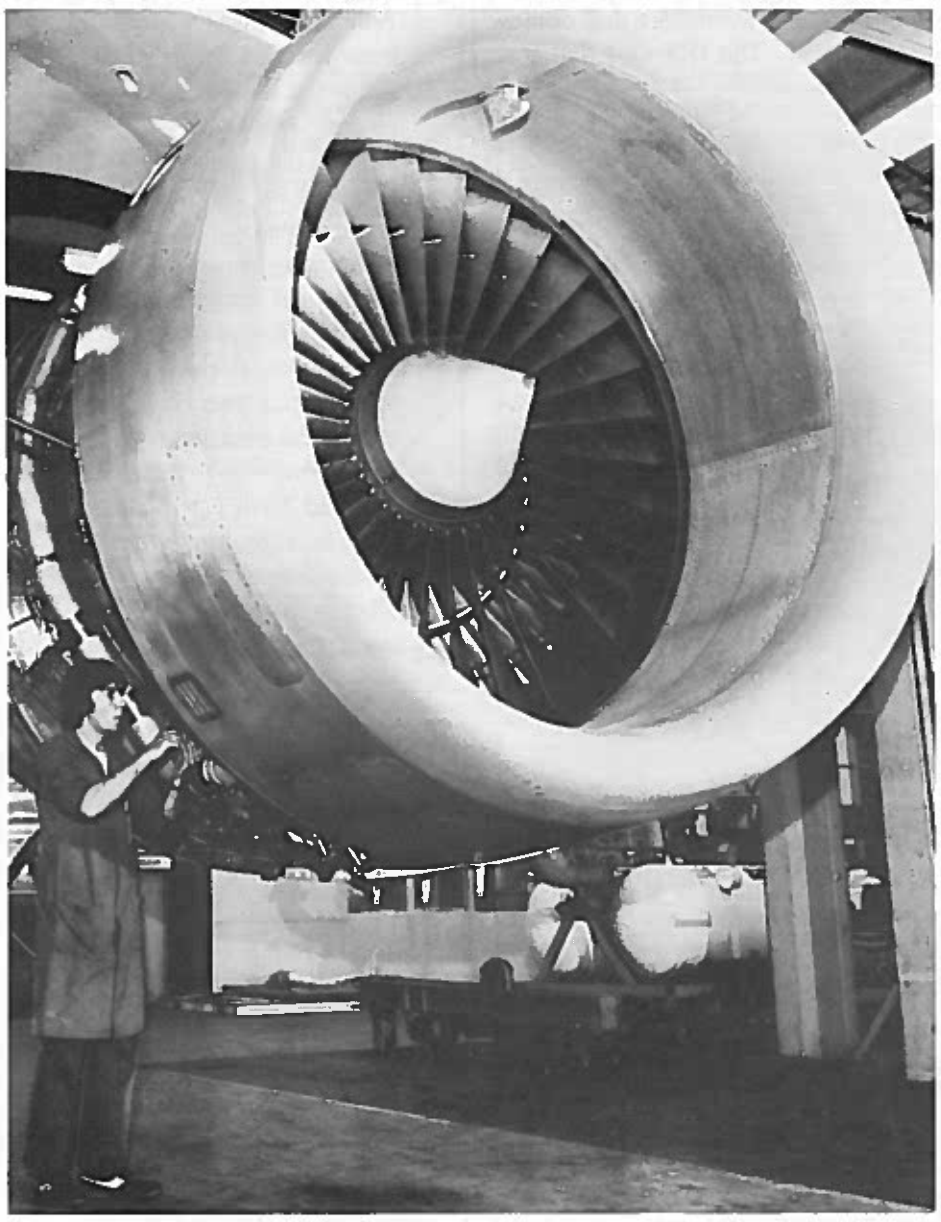
"The test environment includes everything from a blast furnace to a deep freeze," says Schiano. "For that reason, data acquisition instrumentation must be rugged to survive those extremes."

ADR-3 is just one part of an overall modernization scheme at Rolls-Royce. Computer aided design and manufacturing (CAD/CAM) and factory automation are also part of the "pie," and all three elements will be linked.

"Unlike most of the test systems Grumman has developed in the past 20 years, this one will not be a stand-alone," says Schiano. "This project will push the limits of high technology. Even Grumman hasn't evolved to the point yet where engineering, test, and manufacturing are linked in one system. We're working on it — but we're not there yet."

Data Systems competed against four British companies for the contract, including System Designers Ltd. Project plans and logistics necessitated the teaming arrangement, which is quite common in Europe. That's especially true where the sale of services from one nation to another is involved.

The program team has a lot of work ahead. "Rolls-Royce needs to keep up with the competition, so it plans to complete the project within a critical time period," says Schiano. "It's an ambitious project for us. Fortunately, we've got a good relationship with the customer. They consider us the experts in the area of real-time testing."■



Rolls-Royce Of Engines. *Grumman Data Systems has won a contract to design an aircraft engine test system for Rolls-Royce of Britain. Shown is an engine coming off the line at Rolls-Royce's commercial engine facility in Derby, England.*

What's Inside

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Don't Get Caught Short In '88; File A New W-4 Form In Early '87

More than likely, your 1987 taxes will be affected by recent changes in the tax law. To have the proper amount of tax withheld from your pay in 1987, you must file a new, revised W-4 form, officially called the Employee's Withholding Allowance Certificate.

A new W-4 must be filed even if the number of your allowances does not change from 1986 to 1987. Forms are available at all Employee Services offices and in mail rooms; they should be sent to Personnel Records, E09-GHQ.

The new, four-page W-4 form reflects the changes brought about by the Tax Reform Act of 1986. The Internal Revenue Service says that taxpayers will be able to figure their withholding allowances more accurately than with the old W-4 forms.

"It's in your best interest to file a new W-4 early in 1987," says Doug Dahlgard, director of Grumman's Corporate Tax Department. "Submitting a new W-4 early in the year will help avoid being under or over withheld."

If you do not submit a revised W-4 form by October 1, 1987, Grumman is required to withhold income taxes on the basis of one withholding allowance in the case of single employees and two allowances in the case of married employees.

In addition, Grummanites who wait until late 1987 to revise their W-4s may have to request extra withholding to make up for too little withholding earlier in the year.

Because most state taxes are based on the federal system, a new state withholding form should also be filed along with the new W-4. "Filing a new W-4 does not automatically change the state withholding allowance," says Dahlgard.

The IRS warns that those who have too little withheld for the year may be subject to a penalty. To avoid a penalty the IRS requires all employees to pay by withholding and/or estimated payments the lesser of: 90 percent of your 1987 tax or 100 percent of your 1986 tax.

The new law has done away with many deductions. Here is a summary of some of the provisions that have been repealed:

- Deduction for a married couple when both spouses work.
- The itemized deduction for state and local sales taxes.
- Charitable deductions for persons *not* itemizing.
- The tax credit for political contributions.
- The dividend exclusion.

Here are other changes for 1987:

- Long-term capital gains are fully taxable; the old law allowed 60 percent tax-free.
- The deduction for consumer loan interest is being phased out. In 1987, only 65 percent is deductible.
- The deductibility rules for Individual Retirement Account contributions have been changed. There are restrictions for Grumman people because they are covered by a pension plan — regardless if vested or not. You can only take the full IRA deduction on your income tax if you are single and earn $25,000 or less annually in adjusted gross income. If you earn over $25,000, the amount you can deduct drops in steps — $200 for each $1,000 in income until you hit the $35,000 limit.

Married people filing jointly can keep the full deduction if their combined income is less than $40,000. However, the deduction decreases if either spouse is in a corporate pension plan. It disappears altogether when adjusted gross income reaches $50,000.

- Only amounts that exceed two percent of your adjusted gross income can be deducted for miscellaneous itemized deductions, such as tax preparation fees, or unreimbursed employee business expenses.
- Only amounts that exceed seven-and-a-half percent of your adjusted gross income can be deducted for medical expenses. It used to be five percent.
- Certain tax shelter losses from pre-1987 investments are being phased out; only 65 percent deductible in 1987. Losses from post-1986 investments are not deductible at all.
- Losses from active participation in rental real estate activities are limited to $25,000, but are subject to further restrictions for higher income earners.

To arrive at the proper number of withholding allowances, you should use the worksheet that comes with the W-4. The IRS says that two-earner couples should use one work sheet and combine their earnings. If the spouse with the higher earnings takes all the withholding allowances, the couple's withholding will be more in line with the tax they will owe.

When completing the W-4 form, make sure you include your *company (division)* code in the space provided. Here are the company codes:

01-53	Grumman Services
01-54	Aerostructures
01-55	Aircraft Systems
01-56	Electronics Systems
01-57	Space Systems
01-58	Melbourne Systems
03-03	Grumman Corporation
03-07	Grumman Credit Corp.
03-10	Grumman International
03-12	Paumanock Development
04-04	Data Systems
04-36	CallData Systems Dev.
04-62	InfoConversion
04-63	Data Systems Institute
04-64	Systems Maintenance Services

Dahlgard recommends keeping your W-4 worksheet. "It's a good idea to recheck the calculations after a few months," he says. "If for some reason, the withholding is not correct, you should file a revised W-4 form."■

Moving Machine. *Flown by Grumman test pilot Tom Gwynne with Al Beck in the back seat, the first Block 60/65 Update F-14 took to the air for the first time on December 11 at Calverton. It is now in the hands of the Texas-based squadrons of the Naval Air Reserve. (Photo by Karl Thoma)*

IRS Wants Your Kids' Numbers

Grummanites might want to get a jump on their 1987 tax returns which must be filed by April 15, 1988. On the 1987 tax returns, taxpayers will have to list social security numbers for all their dependents over the age of four.

To get social security numbers for your dependents, stop by your local Social Security office and pick up an SS-5 form. An original or certified birth certificate must be submitted with the SS-5 form. The process takes several months.

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Norine Lyons
Manager — Internal Communications
575-3720

Kathleen Housley
Editor — 575-3293

Associate Editors
Debra Pagan — *575-8999*
Bob Sample — *575-5118*
John Vosilla — *575-5119*

Bernadette Gately
Editorial Assistant — 575-4334

What's In Store. *In the Advanced Aircraft Armament System (A^3S) lab in the William T. Schwendler Development Center in Bethpage, engineer Theresa Smith analyzes the Store Station Equipment (SSE). It's part of an A^3S management system that monitors and controls the weapons and other stores being carried by an aircraft. This project is the first of the four six-month tours for Smith in the Masters Fellowship program. She's working towards an advanced degree in electrical engineering. (Photo by Bob Settles)*

Cooperation Is The Key To Smoking Law Compliance

For the most part, Grummanites on Long Island are complying with the new regulation restricting smoking in the workplace. However, the fact that violations exist is forcing Grumman to do more to clear the air.

"We sympathize with smokers and understand how hard it is for them to limit their smoking to specific times and places, but the law is the law and we must enforce it."

When complaints are received or violations observed, supervisors will be notified in writing and urged to enforce the regulations.

Personnel Relations fields many of the complaints. "All of the complaints we've received have been from the office environment, nothing from the shops," says Leo Kelly, Personnel Relations manager. "Compliance for the most part has been good."

"The number of complaints has died down lately," Byrne notes. "Hopefully, that's not because nonsmokers have given up. There are still some instances of obvious non-compliance and we can't overlook them. We don't want to make anyone the bad guy, but we don't have a choice. In Nassau and Suffolk we're dealing with laws and the company will be held accountable."

Grumman's desire to clear the air stems from more than a simple desire to obey the law, Byrne adds. A recent report on health and smoking from the United States Surgeon General, Dr. C. Everett Koop, links lung cancer among nonsmokers to "involuntary smoking" — the inhaling of smoke from others' cigarettes.

The report points to a National Academy of Sciences estimate — disputed by the Tobacco Institute — that involuntary smoking is the cause of some 2,400 lung cancer deaths a year among nonsmokers. This conclusion was inferred from studies done in a number of nations, including the United States.

At a news conference, Dr. Koop said, "It is now clear that disease risk due to inhalation of tobacco smoke is not solely limited to the individual who is smoking, but can also extend to those individuals who inhale tobacco smoke in the room air."

No Smokescreen. *When Grumman's smoking rules are violated, county laws are broken. (Photo by Rich Breunig)*

"Even if smokers don't care about their own health," says Byrne, "we are asking them to consider their associates."

One of the steps Grumman is taking to safeguard the health of nonsmokers and smokers is the removal of cigarette machines from all Long Island locations.

"We feel in good conscience that we should not be promoting the sale of cigarettes," say Byrne.

To help smokers quit, Grumman will offer FreshStart programs again. The times and locations will be announced when new sessions are scheduled.

If you want to report violations of the smoking rules, contact your supervisor. If that doesn't help, call Personnel Relations at Ext. (111) 53521.■

Grumman Launches 1987 Lecture Series On Jan. 26

On Monday, January 26, Grumman will launch its 1987 Leroy Grumman lecture series in the Headquarters auditorium at 4:30 p.m. Guest speaker will be Dr. Gerald Kulcinski, director of the Fusion Technology Institute at the University of Wisconsin. His lecture is entitled "Lunar Source of Helium 3 for Commercial Fusion Power for the 21st Century."

The professor will talk about mining the surface of the moon for helium 3 — which is abundant on the moon but scarce on Earth. He believes that it is possible to supply a large part of the Earth's energy needs for 1,000 years or more by burning lunar helium 3 in thermonuclear fusion reactors here on Earth.

Dr. Kulcinski has been a member of the American Nuclear Society since 1961 and is currently a Fellow in the society. From 1979 to 1981, he was a U.S. delegate to the International Tokamak Reactor Project in Vienna, Austria (INTOR).

All Grummanites are invited to the January 26 lecture, but space is limited. To make a reservation, call Susan Boccasini at Ext. (111) 63396 or 53766.

Guest speakers at future lectures will include scientists from universities, research institutions, and government agencies. Topics will include aerodynamics, electronics, physics, and information processing.

The series was established in honor of Leroy Grumman, one of the company's founders and its first chairman and president. The series seeks to continue his commitment to technical excellence.■

Personals

My family and I wish to thank my co-workers in Safety and Hygiene, and our Grumman family of friends for their kind expressions of sympathy during my recent loss. **Mike Francesco**

My family and I wish to thank all my fellow workers in Grumman for their kindness and consideration in our time of sickness and need. **Newell Graves**

My family and I wish to thank all our friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of my brother. **Jim Maskulyak**

I wish to extend my deepest thanks and appreciation to all my fellow employees and ESO for the beautiful flowers and kind words of sympathy during the recent loss of my mother. **Fred McCrum**

My family and I wish to thank our friends, co-workers and ESO for their kind expressions of sympathy during the recent loss of our son and brother. **Georgia and Eugene Bagnall and Eugene Bagnall Jr.**

I wish to thank my co-workers and ESO for their kindness during my recent convalescence. **Paul Herbst**

My family and I wish to thank friends and co-workers for their kind expressions of sympathy during the recent loss of my mother. **Edward Leonard**

I would like to thank my co-workers and ESO for their kind expressions of sympathy during the recent loss of my mother. **Stanley J. Laskowski**

Retiree Obituaries

Clarence B. Carr of 919 Tanager St., Venice, Florida, died October 31, 1986. He retired in 1975.

Peter Charpentier of 131 Hempstead Ave., Lynbrook, N.Y., died Sept. 30, 1986. He retired in 1975.

Selden A. Converse of 623 Emerald La., Holmes Beach, Florida, died November 20, 1986. He retired in 1968.

Joseph L. Dorsch of 67 Shore Rd., Clinton, Connecticut, died November 20, 1986. He retired in 1965.

William W. Foley of 691 South 450 E., Orem, Utah, died November 28, 1986. He retired in 1975.

Royal K. Gallup of 59 Hegerman Landing Rd., Rocky Point, N.Y., died November 28, 1986. He retired in 1971.

Malachi F. Gannon of 2455 N. Tropical Trail, Merrit Island, Florida, died Sept. 21, 1986. He retired in 1973.

Eugenia Jamerson at P.O. Box 157, Hollis, N.Y., died November 12, 1986. She retired in 1977.

Charles E. King of 2216 7th Ave., Pueblo, Colorado, died November 17, 1986. He retired in 1975.

Henry Kowalski of 354 Fenimore Ave., Uniondale, N.Y., died December 4, 1986. He retired in 1982.

Edna Leonhardt of RD1 Telegraph Rd., Bath, N.Y., died November 27, 1986. She retired in 1970.

Richard Lindsay at Box 455, Wicomico, Virginia, died November 25, 1986. He retired in 1973.

William J. Mason of 206 N. Queens Ave., North Massapequa, N.Y., died November 11, 1986. He retired in 1983.

Phillip Miles of 821 East Main St., Riverhead, N.Y., died November 18, 1986. He retired in 1974.

Vito M. Montanaro of 11 Elder Dr., Commack, N.Y., died November 21, 1986. He retired in 1964.

John Mruz of 78 Linden St., Massapequa, N.Y., died November 6, 1986. He retired in 1984.

Anthony Napoli of 500 Beebe Dr., Cutchogue, N.Y., died November 19, 1986. He retired in 1965.

Dorothy R. O'Dea of 18 Rolling La., Levittown, N. Y., died October 28, 1986. She retired in 1973.

Margaret Olofson of Lillesand 4790, Norway, died November 9, 1986. She retired in 1968.

Arthur J. Sherry of 7 Litt St., Patchogue, N.Y., died November 16, 1986. He retired in 1986.

Thomas J. Shokey of 646 34 Ave. North, St. Petersburg, Florida, died November 20, 1986. He retired in 1970.

Berkeley A. Wiggin of 414 Ackerson Blvd., Brightwaters, N.Y., died November 7, 1986. He retired in 1982.

X-29 Becoming A Familiar Sight In The Mojave

Grumman-built experimental aircraft finishes level envelope expansion flight tests with an excellent record

EDWARDS A.F.B., California — The X-29 advanced technology demonstrator does a 360-degree turn in preparation for its fourth landing of the day. Nothing fancy — it's a standard maneuver.

It's been two years since the forward-swept-wing X-29 took its first flight here at NASA's Ames-Dryden Research Facility. While the fanfare has died down, the X-29 has racked up a virtually flawless record. The most recent tests were for the envelope expansion program, which brought the aircraft to its maximum level flight altitude and speed performance and wrapped up 104 flights.

For the visitor, the X-29's a treat to watch. Against the shocking blue desert sky, this plane is small, swift, and nimble. Though the X-29 was deliberately designed to be "dynamically unstable," and able to fly only with the assistance of ultrasophisticated computers, it doesn't look it.

Three pilots took part in each envelope expansion flight: one in the cockpit, a second in the T-38 chase plane, and a third monitoring a terminal in NASA's automated telemetry station. Although test pilots are usually thought of as hot-shots and daredevils, this particular type of flight test program is deliberately conservative.

"These tests are a slow, progressive gathering of data," says Charlie McLaughlin, team manager of the 40 Grummanites who moved temporarily to Edwards to monitor the program. "The X-29's a two-of-a-kind demonstrator aircraft, so you must proceed cautiously, keeping safety issues in mind and allowing enough time between test flights for proper analysis of the data."

'The X-29's a two-of-a-kind demonstrator aircraft, so you must proceed cautiously.'

"We've determined how fast, how high, the aircraft can be flown and how many Gs it can pull," says Don Evans, Grumman's permanent site manager at Edwards and a retired Air Force pilot. "All along the way, engineers in the automated telemetry station thoroughly monitored the flight control system, wing loads, the response of the flight controls to the pilot's inputs, wing divergence or bending, and flutter."

The program gradually progressed from high altitude flying to low altitude flying, finishing at 5,000 feet. At high altitudes, an aircraft encounters low dynamic pressures. The reverse is true at low altitudes.

With higher dynamic pressures come greater loads and stresses on the aircraft's surfaces — particularly its aeroelastically tailored, forward-swept wings. The envelope expansion represented the first true tests of their ability to resist bending. Prior computer models were able to predict at what points divergence would be reached, but no actual flight data existed.

'Even if we wanted to, the control system wouldn't let a pilot take the plane on radical maneuvers.'

All flights were at transonic speed — approaching, or just barely exceeding, Mach 1. The duration of the flights decreased from an hour and a half at the beginning of the program to approximately 20 minutes at its end. The reason: flying transonic at low altitudes causes the plane to encounter more resistance, and gulp more fuel. To save on weight, the plane was designed with low capacity fuel tanks.

Inside the cockpit, flying the X-29 is every bit as smooth as it looks. The reason: that same ultasophisticated flight control system, an array of electronically activated sensors that adjust control surfaces 40 times a second to maintain level flight.

"The technical term for this is artificial stability," says NASA pilot Steve Ishmael. "On this aircraft, the onset of attitude change is very controlled. The control system has the power to stop the motion in a split second before the aircraft can go out of control.

"Even if we wanted to, the control system wouldn't let a pilot take the plane on radical maneuvers," adds Ishmael.

Last June, the X-29 began taking more than one flight a day to take advantage of good weather. To do so requires an early morning start: the desert winds reach about 25 knots around 2 p.m., and to take off then would be risky.

During a flight, the telemetry station buzzes with activity. Up front, a giant-screen TV with an amoeba-shaped pattern on it charts maximum allowable loads on the aircraft's control surfaces. Above that, an illuminated map traces the X-29's flight path. Another monitor looks like the arrival-departure screens in airports. These are numerical readouts from the flight control system.

"We have had a great flight rate," says McLaughlin. "We have set three new records for 'X' aircraft. We took the most flights in a day — four, the most in a week — seven, and the most in a month — 17."

"Multiple flights per day is purely a function of pragmatics," says Ishmael. "But one of the reasons we were able to do that is the X-29 has been so reliable. It's always frustrating to get everything ready to go and at the last minute, have to cancel a flight due to a problem. When a plane is as reliable as the X-29 is, that gives everybody a real sense of accomplishment."

The level flight envelope expansion program finished just as the winter rains were beginning. In the spring, loads expansion and performance testing will begin on the X-29. Another engine is being installed, this one equipped with special instrumentation to measure thrust-to-drag ratio. Instrumentation and control devices installed for the envelope expansion program will be removed. The performance tests will span about 18 months.

The flight test program so far has involved level flying. The next phase will take the X-29 to extremes of the envelope — requiring the aircraft to dive to corners of the envelope, resulting in maximum G's, dynamic pressures, and speeds.

The later performance flying will again be level. "Generally, performance flying is even more routine than envelope expansion," says Ishmael. "It deals with a lot of simple flying equations. We measure the aircraft's performance, then compare, contrast, and hopefully, validate it in relation to the computer predictions. It can be a difficult task — but not a hair-raising one.

"It's an evaluation of the design tools as well as the aircraft itself."

The performance tests will gauge the impact on performance of individual control components

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— such as the canards and the trailing edge flaperons. The team will also study how these items work together.

"The X-29 is really a collection of experiments, as opposed to a prototype put up to do a given mission," notes Ishmael. "Designing and building an aircraft from scratch creates a lot of synergistic effects that you wouldn't obtain from a single experiment — if you put canards on an F-16, for example."

This research will enable designers to assess the merit of such items for future aircraft — particularly the Advanced Tactical Aircraft for the Navy and Advanced Tactical Fighter for the Air Force. The X-29 tests have already proved out some sophisticated technologies, most notably the all-digital flight control system.

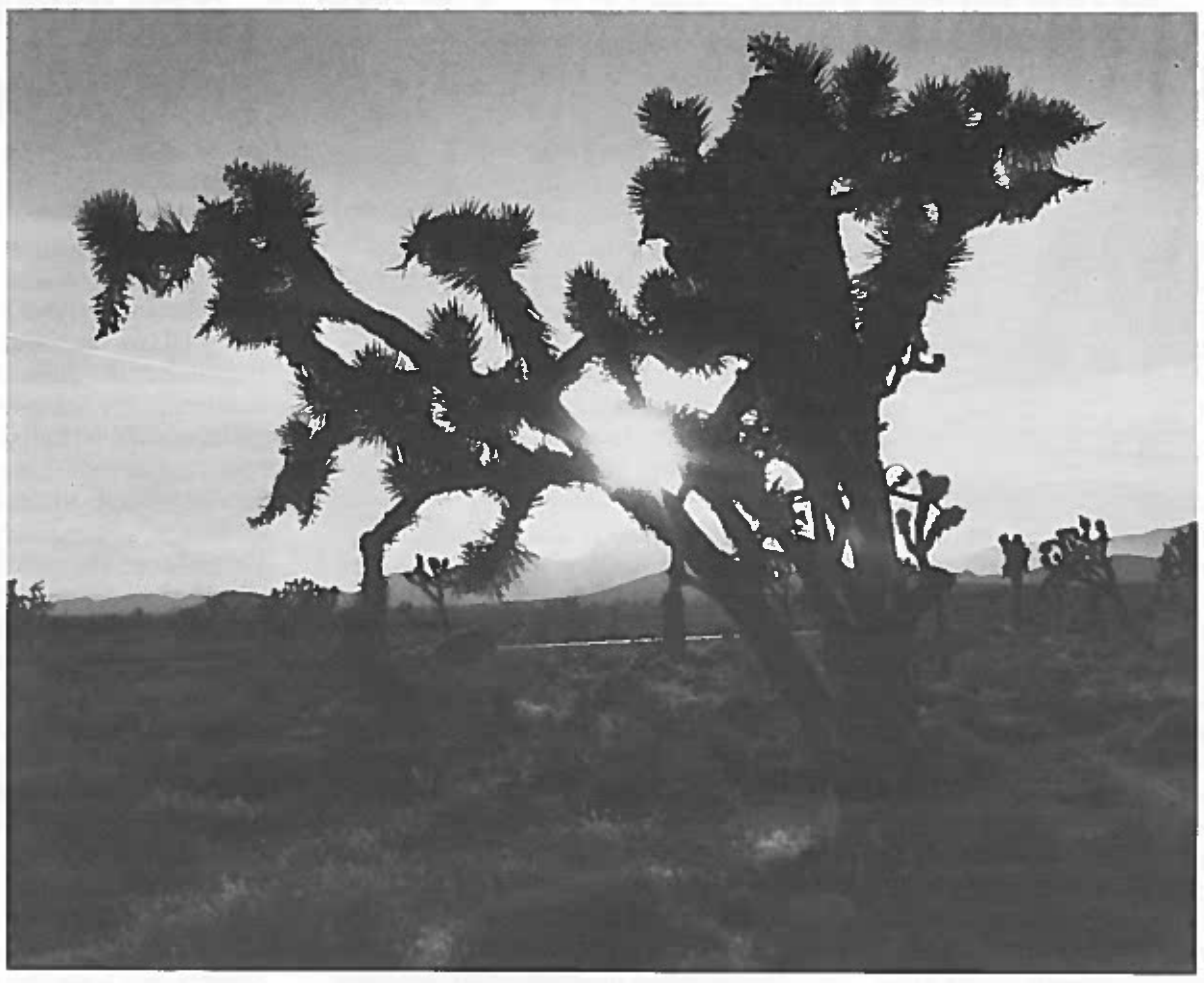
According to John Calandra, X-29 program director, the Air Force plans to test fly the second X-29, originally built as a backup. The X-29 is currently limitted to 20 degrees angle-of-attack. Equipped with a spin chute, this number-two airplane will fly to 90 degrees angle-of-attack. Those test flights would begin sometime in 1989.

In the future, other technical enhancements may be added to maximize the aircraft's maneuvering capabilities. Under consideration are such technologies as thrust vectoring and integrated flight and propulsion systems.

"We've been extremely happy with the flight test results so far," says Calandra. "The aircraft has performed better than predicted on most measures."

"One of our main goals, established early in 1986, was to expand by the year's end the flight envelope to the maximum airspeed attainable at one G in level flight, at altitudes from 10,000 to 40,000 feet," says Grumman Chief Test Pilot Schroeder. "The fact that an aircraft as radical as the X-29 was able do that with only one minor modification to the flight control system is evidence of the talents of all the Grummanites who designed and built the aircraft."■

Step It Takes. *At left, the X-29 soars over Edwards Air Force California, while a team of Grumman, NASA, and Air Force (above and above L) monitor its progress. The X-29 has been ly reliable so far; only two flights had to be cancelled for roblems.*



Desert Bloom. *Scenes like this stand of Joshua trees are common on California's Mojave Desert.*

Why The Bumper Stickers All Say 'I Love Lancaster'

"Coming over the mountains from L.A., it looked like Mars at first," recalls flight test engineer Paul McCrosson. "I thought to myself: "Oh, great. What have I gotten myself into?"

McCrosson was one of several dozen Grummanites who monitored the X-29's envelope expansion program in California's Mojave Desert. Now that it's over, all but a handful have returned to their permanent homes. While you'd expect people to shudder at the thought of moving to the desert, once there, most of the Grummanites at Edwards grew to like it.

First of all, it's not a wasteland of sand dunes. Rugged mountains are part of the vista, in hues of orange, gray, and purple. The desert floor is covered with a patchwork of brown and olive-green scrub, yellow sagebrush, cactus, and Joshua trees. Generous irrigation gives Lancaster — where most of the Grummanites lived — lots of shimmering eucalyptus trees.

"It's really a lot like the East End of Long Island — you're isolated, but the city's within a few hours' drive," says McCrosson. "There was plenty to do, and more after-hours socializing than you find among people working together on Long Island."

Josephine Larson, a software engineer, opted for a permanent assignment at Edwards: working on the X-29 flight simulator there. "There's plenty to do in the area," says Larson. "For one thing, there are an incredible number of movie theaters, and nightclubs are less crowded and smoky than back east."

Recreational opportunities abound within a few hours' drive. Over the San Gabriel Mountains is Los Angeles, which offers everything in both highbrow and lowbrow entertainment. Two hours to the west are the beaches of Ventura and Santa Barbara. Seventy-five miles north are the Sierras and Mount Whitney — the tallest mountain in the continental U.S. Further north are Mammoth ski resort, the giant sequoias, and Yosemite National Park.

NASA's recreation department is open to employees of contractors and the Air Force. You can get discounts on beach condos, campers, studio tapings, Disneyland and sports events, to name a few bargains. There's even an aerodynamics club which offers cut-rate flying lessons.

"Recreationally, about the only thing I missed about Long Island was playing on the Grumman Varsity Tennis Team," says Jean Stewart, an administrative assistant for the X-29 team. "There are a lot of other things to do that more than made up for that — for instance, I climbed to 9,400 feet at Yosemite. It was the first time I went backpacking.

"Another nice thing about the desert: you can ride a motorcyle, and they are really popular there," adds Stewart. "It beats driving 10 miles an hour on the L.I.E."

There were a spate of weddings during the Grummanites' stay. Larson and her husband, Eric, a Honeywell engineer who also works on the X-29 program, were married in May of 1985 and now have an infant son. She ticks off the names of about eight other couples who have gotten married during the test program.

The desert climate requires getting used to, say these Easterners. You drink a lot of water. Allergies improve for some, worsen for others. Chapstick becomes a necessity. You tend to use a lot of shoe polish.

Newcomers learn to watch out for black widow spiders, scorpions, and Mojave Green rattlesnakes. There's lots of less malevolent wildlife: coyotes, jackrabbits, and roadrunners. "You think they're huge, but do you know how big a roadrunner actually is? About that high," says Larson, holding her hand about 20 inches from the floor.

But the best thing about the assignment was the X-29. "In the beginning, I wouldn't have come to Edwards except for the professional experience," Larson says. "There are a lot of new high-technology concepts being proved out. It's a very exciting place to be."

Grummanites Pack Their Cameras For Two-Year Assignment In Egypt

Forty-seven Grummanites will travel to Cairo, Egypt this month to train the Egyptian Air Force to operate and maintain the E-2C Hawkeye. For two years, this country of vast deserts, pyramids and the Great Sphinx will be home to the Grummanites and their families.

Under a Navy foreign military sale contract, Grumman is building five E-2Cs for the Egyptians. The first one was delivered in October, 1985.

Over the past two years, 190 Egyptian service people attended classes in Bethpage, Long Island, and received extensive training in the Hawkeye's hardware and software. Now, the Grummanites will give the Egyptians hands-on training at their air base to help them get the aircraft fully operational.

"By the time we're ready to leave, the Egyptians will be Hawkeye experts," says Dave DeBetham, Field Operations training coordinator for the Grumman Egyptian project.

In preparation for the move, the Grumman families had to acquire passports, visas, and international drivers licenses; fill out stacks of forms; and get complete physicals and shots.

Upon arrival in Cairo — a city of 12 million people — they'll stay in hotels until four apartment buildings are completed in early February. The buildings are in Maadi, a small town along the Nile that is considered one of the best suburbs in Cairo. If it weren't for the dust in the Maadi air, a visitor would never know that vast deserts are nearby. The town has tree-lined streets, thanks to an extensive irrigation system.

Although Egypt and the U.S. are strong allies, there is always the threat of terrorism in the Arab world. For protection, a security guard will be posted outside the Maadi apartment complex. In addition, a two-way radio, linked to the American Embassy, will be in the complex's family center. Security is also tight at the air base, which is a two-hour drive from the Grumman apartment complex.

The Grummanites join 10,000 other Americans living in Egypt. Though the Grumman apartments will include all the comforts of home — such as a washer/dryer, refrigerator, dishwasher, and air conditioning — Grummanites will certainly have to make adjustments.

"I'm sure it won't always be easy to get items there that I take for granted in the United States," says DeBetham. "I'll be bringing boxes of non-perishable items that are hard to come by in Egypt, such as laundry detergent. One of the things I'll miss most is eating bagels. Maybe there will be a synagogue there and with any luck, one Jewish baker.

"Obviously, there won't be any Yankees or Mets to cheer for," he continues. "McDonald's will be out and lamb and beans will be in."

As a single person, DeBetham has lived in many different places, so he'll have an easier time than most acclimating himself to his new home.

"Every time I move somewhere new I look at it as a challenge," he says. "My challenge here will be to learn as much about the Egyptian people and their culture as possible. I want to walk the ruins and sail the Nile." On the bus to work, DeBetham and his colleagues will pass the Great Sphinx and the pyramids.

In addition to historical sites, there are plenty of other things to see in the area. Shoppers can wander down any street in Maadi or Cairo and see glass blowers, potters and saddlemakers. Cairo has ballets, concerts, plays and childrens' theatre.

For another Grumman family, the assignment will be an opportunity to spend more time together. "As a field rep, I'm always traveling," says Frank Lockwood, Jr. "In fact, I was away when my youngest was born. We're all looking forward to this trip."

Lockwood will teach the Egyptians how to use the Computerized Automatic Tester, which tests E-2C black boxes. Traveling to Egypt with Lockwood and his wife Janice will be Roxanne, 9; Scott, 7; Benjamin, 2; and Sarah, two months.

The Lockwoods have lived on Long Island for the past year and before that, in different parts of California for six years. The children will attend school at the Cairo American College. The private school, located in the heart of Maadi, is for children in grades kindergarten through 12.

For parents and children, new time schedules will take getting used to. The work and school week is Sunday through Thursday. Friday is a Moslem holy day and Saturday is a day of rest.

The Lockwoods aren't worried about bringing their children to a third world country. "We want our children to see how less fortunate people live," says Janice. "Plus, the experience of living in a different country and traveling in our free time can only enhance all our lives."

The Lockwoods have another reason to feel more secure about their new home: they've had first-hand reports of what Cairo is like. Frank Lockwood Sr. is a Grumman logistics support representative who is working with suppliers in Cairo.

"My mom and dad have been there since August so they've written to us telling us what to expect," says the younger Lockwood. "They are quite happy there. This is the first time at Grumman that a father and son volunteered at the same time for a foreign program."

"So far, my in-laws haven't seen a cobra come out of a basket or a belly dancer perform," says Janice. "However, they warned us not to be surprised at the poverty everywhere. They also advised us to watch out for heat exhaustion and the sun, especially fair-skinned people like myself."

"We were also warned not to drink the water unless we boil it first," says Lockwood. "It comes from the Nile, which is parasite ridden. But we can always buy bottled water."

Teen Traveler. *Michelle Olson, daughter of engineering specialist Frank Olson, packs her favorite albums for Egypt. (Photo by Gerry Costello)*

Frank Olson, engineering specialist for E-2 Display Software, is bringing his wife, Arlene, and their three children: Michelle, 16; Dana, 13; and John, 11.

Olson will not be working at the Air Force Base with most Grummanites. He'll work 20 minutes away from the complex in a new six-story office building in Maadi. Here, he and five other Grummanites will train Egyptians to program E-2C software.

"Leaving the United States will be the hardest for Michelle," says Olson. "She is a typical teenager who will miss things like watching MTV and buying Madonna-type clothes. The two younger ones are looking forward to traveling. My wife will be lost without her microwave and have to get used to cooking in the oven again.

"However, my biggest misgiving about the trip is selling my Dodge truck," continues Olson. "The desert would be the perfect place for it as it has four-wheel drive. As far as traffic in Cairo goes, I hear it's a nightmare and worse than the Long Island Expressway. I never thought that could be possible."

Olson also thought he'd never be without his favorite foods. "Things we usually take for granted like peanut butter and canned tomatoes can't be found in Maadi," he says. "The American food that is available at the local markets will be expensive. Products made in Egypt are cheaper than imported items. For example, a nine-ounce bottle of Coke manufactured there costs 10 cents, whereas a box of cereal imported from the U.S. is $3.

"Needless to say, we'll be eating lots of what's most plentiful in Egypt: pigeon," he says.

The Grummanites on the program enjoyed working with the Egyptians in Bethpage, and are looking forward to getting to know them better in their homeland.

"I found the Egyptian people to be warm, gracious, and most important, tolerant," says Olson. "We'll be learning from each other and in a small way, help build a stronger friendship between America and the Arab community."■

Pitching In. *(L-R) Scott, Roxanne and Benjamin Lockwood help their dad, Grumman field rep Frank Lockwood Jr., pack items that are scarce in Egypt. Janice Lockwood is bringing plenty of diapers and baby food for two-month old Sarah. (Photo by Rich Breunig)*

Across The Nation, Grummanites Donate Over 12 Tons Of Food

Nearly 33,000 pounds of food were donated by Grummanites nationwide during the second annual Grumman Food Drive, held December 8-12.

The overall total for the drive may reach 36,000 when Nancy Stursberg, the drive's coordinator, receives reports from all participating Grumman sites. That is three times what was collected during the first Grumman drive in 1985. On Long Island, Grummanites donated over 27,000 pounds of food. In addition to the cans of high protein foods, Grummanites donated 330 holiday turkeys.

"The response was excellent," says Bill Waas, director of Strategic Planning for Grumman Data Systems and director of the annual Food Drive.

"We collected lots of high quality foods, such as hams and canned meats," he notes. "Plus, since most of the turkeys were distributed before the holidays, they became holiday dinners for many families."

On Long Island, the food went to Long Island Cares food bank, which supplies food to meal programs, emergency kitchens and other organizations. "We define success of a food drive as educating people that hunger exists," says Terry Surbeck, program director of L.I. Cares food bank. "As people become educated, drives are more and more fruitful. The dramatic increase in donations at Grumman shows that your employees have become acutely aware that there is a hunger problem."

Elsewhere, the food went to food banks and other agencies in the hometown of each participating Grumman facility. Not all participating sites were able to report the results by press time, but among those that did, the numbers were impressive.

In addition to 100 pounds of food, the 30 Grummanites in the Tachonics unit of Electronics Systems, Plainsboro, New Jersey, donated $144 to their local food bank.

Grummanites in Houston collected 2,000 pounds of food in the drive, compared to 800 pounds in 1985. "Houston recently set up its own food pantry. People know others are in need, so they want to help," says Hank James of Grumman Houston's Personnel Relations and the drive coordinator there.

Floridians had another banner year, despite lower employee populations at some locations. The Aircraft Systems people at Stuart collected 800 pounds of food, Grumman St. Augustine pitched in with 460 pounds, and Technical Services in Titusville collected 400 pounds.

In the Washington, D.C., area — specifically Grumman Systems Support in Gaithersburg, Maryland, and Grumman-CTEC in McLean, Virginia — Grummanites collected 360 pounds of food. Not far away, at the Glen Arm, Maryland, Aircraft Systems facility, 450 pounds were collected. At the Electronics Systems facility in Salisbury, Maryland, Grummanites collected 280 pounds of food.

Aircraft Systems' Milledgeville, Georgia, Operations boasted 160 pounds in its drive and the Grummanites at the Olson plant in Montgomery, Pennsylvania, brought in another 170 pounds.

In other ways, the organizers were pleasantly surprised by the response. For example, there were several five-pound canned hams and many two-pounders in the collection bins. At one Long Island location, there were two cases of baby formula among the donations.

In 1985, Cathi Mytko donated food. But this time the former social worker, now a configuration analyst in Calverton, sent the food drive $25. "I felt it could be used in any way they wanted," says Mytko.

Vito Carnozza, a job shopper at the Corporate Development Center in Bohemia, not only donated food but $50 in cash. "The guy upstairs takes care of me," he says, "and I will take care of someone else."

"In addition, a lot of people volunteered to help us," says Stursberg. "In all, about 30 Grummanites on Long Island offered their time. Some helped pick up food from the numerous buildings on the Island. Others worked as building coordinators — setting up bins, putting up posters, making sure announcements were made."

Bob Evans, who works with Waas and Stursberg in Data Systems Strategic Planning, volunteered the use of his station wagon to collect food from smaller Long Island locations.

Terry Morse, also of Data Systems, took half a vacation day after the drive and spent an afternoon at the L.I. Cares warehouse. She filled 200 shopping bags, each with a complete meal. These so-called pot-luck bags were then sent to local emergency food kitchens for distribution.

"I never volunteered to do this before but I'll definitely do it again," says Morse.

Grummanites Ruth and Scott Smith wanted to help with the drive, but couldn't because of school schedules. Instead they helped at a drive for L.I. Cares at Nassau Coliseum, which was sponsored by the New York Express indoor soccer team.■

Tale Of A Seal. *In Building 2 in Bethpage, Joe Zinzi Jr. seals all outside joints along the air passages and some inside joints of the tail of an E-2C Hawkeye. To make his job easier, Zinzi uses equipment that continuously forces the rubber-like compound into the joint. It still takes a couple of days to finish the job. (Photo by Bob Sagliocca)*

Obituaries

William R. Harwood of Production Building Management, Bethpage, Aircraft Systems Division, died November 14 at the age of 57. He had been with the company since 1951 and resided at 51 Hudson Ave., Roosevelt, N.Y.

John D. Tolmie Jr. of Program Planning, Controls and Budgets, Bethpage, Services Division, died November 18 at the age of 61. He had been with the company since 1964 and resided at 7 Harbour La., Oyster Bay, N.Y.

Eugene A. Murphy of Procurement, Great River, Electronics Systems Division, died November 18 at the age of 60. He had been with the company since 1974 and resided at 1081 Manor La., Bay Shore, N.Y.

Joseph Laskowski of Central Shipping, Bethpage, Aircraft Systems Division, died December 8 at the age of 65. He had been with the company since 1963 and resided at 18 16th St., Jericho, N.Y.

Antonio Pietroforte of Building Protection, Bethpage, Services Division, died December 8 at the age of 67. He had been with the company since 1974 and resided at 2618 Park St., Westbury, N.Y.

Next Issue: January 30

Hit Us With Your Best Shot! '87 Photo Contest Has Begun

Deadline for this year's contest is February 16

All talented Grummanites are invited to enter the 1987 Public Affairs photography contest.

Winning entries will be enlarged to 20x30 inches, framed, and then displayed in Corporate Headquarters for one year. Upon completion of the exhibit, the framed prints will be returned to the winners along with an 8x10 inch negative of the print.

Here are the contest rules:

All photographs must be in color.

Any size print can be submitted.

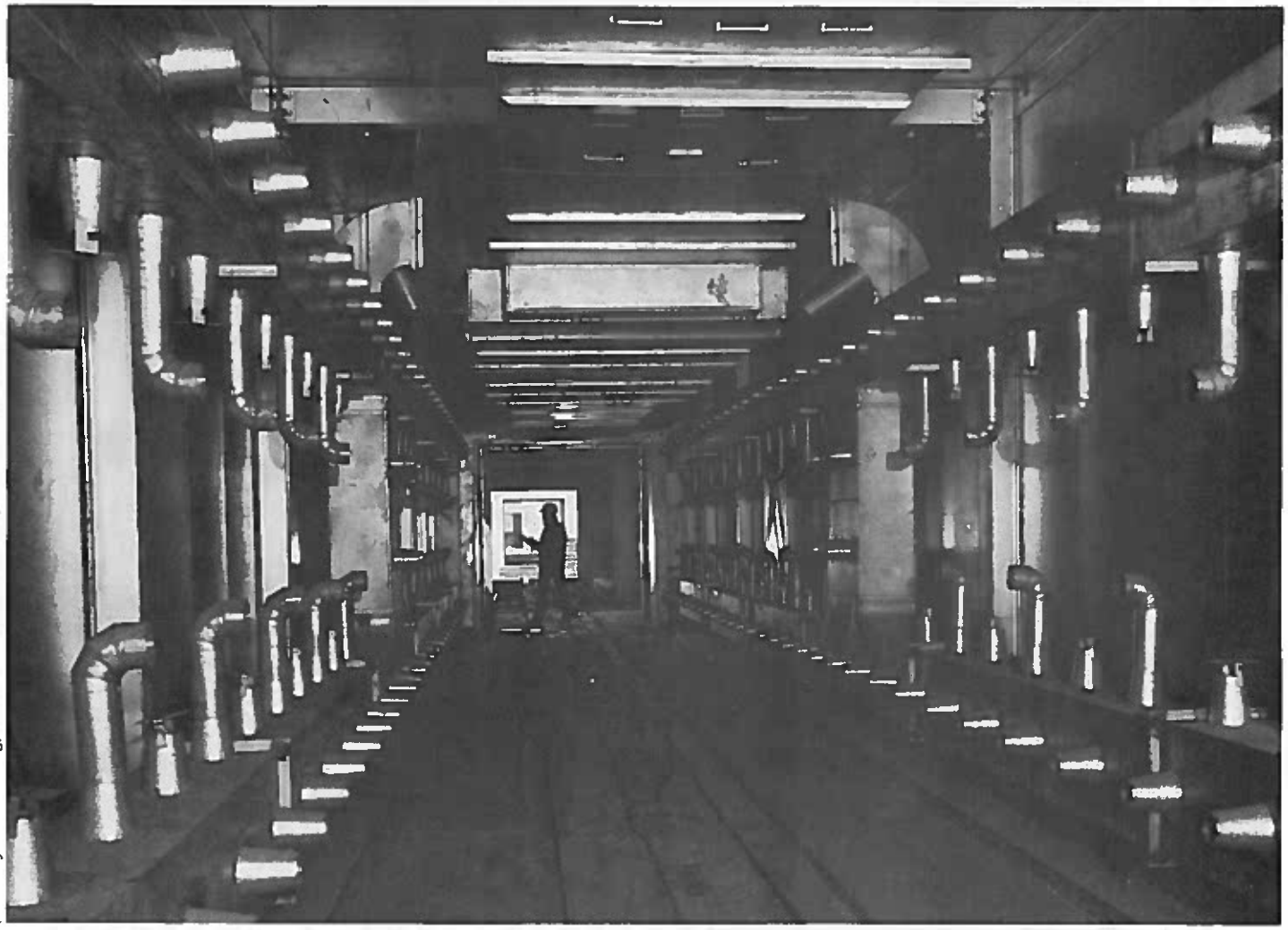
An original negative or slide of the submitted photo must be available upon request.

All photos must be clearly labeled with your name, mail stop, and telephone number.

Entry deadline is February 16; winners will be announced by March 20.

Mail entries to Monique Monaco, A33-GHQ. If you have any questions, call Monaco on Ext. (111) 51426.

GrummanWorld
January 16, 1987



(Photo by Rich Breunig)

Getting Ready To Roll

Beginning in April, freshly painted postal vehicles will pass through this curing oven now being built at Grumman Allied's Montgomery, Pennsylvania, facility.

Under a $1.1 billion contract with the U.S. Postal Service, Grumman Allied will deliver 99,150 Long Life Vehicles (LLVs) between April 1987 and 1993. Grummanites in the updated 213,000-square-foot facility will build 75 trucks a day. Grumman will manufacture the LLV's aluminum body and mate it to a General Motors chassis.

Each of the two ovens, which are near completion, will cure the paint on five LLV bodies simultaneously. In the curing process, air heated to 365 degrees will be blown out of the oven's tubes onto the truck bodies before they are mounted on chassis. Before entering the heat drying oven, each body is washed with alkaline soap, rinsed, sprayed with acid, rinsed again, blown dry, and put in a preheat oven.

Currently, 170 Grummanites build six Grumman Olson truck bodies a day in a nearby building while the Montgomery plant is renovated. The new LLV assembly line will use a conveyor system from start to finish. An LLV will move from work station to work station every six minutes until completion.

About 350 Grummanites will work at the facility during peak production.

Where's My Grumman World?

As with any publication, distribution can be a problem and Grumman World is not immune to snarls in its distribution system.

The corporate newspaper is published twice a month on the second and fourth Fridays. Due to holidays, sometimes this schedule slips, as it does this month.

All Long Island sites receive the paper through the mail rooms on the day it's published. If your department is not receiving enough copies, contact your local mail room.

Grumman World is shipped via Parcel Post to all other Grumman locations. Normal delivery takes about two to three days. If your facility is not receiving enough copies or the delivery is late, please call Bernadette Gately, (516) 575-4334.

All retirees receive their papers via bulk-rate mail; it usually takes about 10 days for delivery. If you are a retiree who recently moved, please write to us and enclose your new and old address. Please include your new and old ZIP codes. Our address is Grumman World, A22-GHQ, Grumman Corporation, 1111 Stewart Avenue, Bethpage, N.Y. 11714. It usually takes six weeks to incorporate a change in the mailing list.

Let Us Know

We'd like to know what you think about the things you see in these pages, and what you see going on in the company. Serious comments, questions and complaints are welcomed, and will be answered by the people most qualified to respond. We'll get back to you promptly with their replies. If the topic is of general interest, we'll print it.

Letters to the editor should be addressed to *Grumman World*, 1111 Stewart Avenue, A22-GHQ, Bethpage, N.Y. 11714, and should include your name and address. Letters may be edited for clarity or space.

GrummanWorld

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